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Dear Chairman,

Ladies, Gentlemen, Colleagues,

I am delighted to be speaking to you this morning, both as a member of the Board of Directors of ERDF, the industrial distribution operator that, in France, manages 1.3 million low and medium voltage transmission lines and serves 35 million customers, but also as an economist, lecturing at the Paris Institute of Political Studies and the Bruges College of Europe.

The global debate about the necessary energy transition, as most of you agreed since Monday, should bring us rapidly to an awareness of the need for decarbonized models; if we really want to avoid the irresistible effects of global warming, we must urgently reduce the proportion of fossil energy sources, the systematic strategy of exhausting the terrestrial reserves of our sub-soils, and better manage our 'green assets' by favoring decarbonized economies, the use of renewable energy sources, investments in projects linked to energy efficiency and undoubtedly by giving a price and a global value to the CO<sub>2</sub> emissions avoided.

Without a global price for carbon, how can we dream of refocusing both energy supply and demand? Consideration of a real global valuation of CO<sub>2</sub> is required. This will be one of the issues of the major Climate Conference that France will host in Paris during December 2015, which already appears to be one of the last gatherings likely to influence the infernal march of national egos.

But this morning I would like to return to a frequently forgotten aspect of energy debates: the pivotal role of energy networks, which are not passive structures for conveying gas or electricity flows, but are contributing first and foremost to the changes in progress, because on the supply side they enable production facilities to be optimized, while on the demand side they connect citizens, who have the potential to be major players in the coming energy transition.

The major networks, particularly in Europe, were constructed at the beginning of the 20th century to support industrialization and create firm links between regions; over time, they have been able to adapt, increase in density and develop; and so, on the days following the liberation of Europe (we commemorated the 70<sup>th</sup> anniversary of D-Day just a few days ago), it is useful to remember that European utilities had the crazy dream of linking European countries together, and today there are 34 interconnected European states (from Turkey to Morocco), enabling us to share electricity supply and demand and avoid major black-outs!

This large interconnected network is now a tremendous utility at a time when energy choices in Europe are diverging between countries, such as Germany or Austria, which are giving up nuclear power, while others such as France or Great Britain are confirming their interest in it. Except hydro and biomass, the more renewable energy sources are used in a given country, the more problems of intermittent supply and power outages, and hence the need to rely on conventional generating capacity to balance supply and demand.

In fact, renewable energy sources profoundly upset the system equilibrium, because their production is scattered and the energy injected into the electricity system through the distribution network. This is no longer the only vehicle for vertically distributed energy; it is becoming bi-directional, which is a considerable challenge. Traditionally, distribution networks were designed to transport electricity in one direction: from the generation connected to the transmission system to customers at the end point of the network. But with solar panels on residential rooftops and wind turbines integrated into industrial sites, customers are increasingly generating electricity themselves. By becoming 'prosumers', they are moving from the end point to the center of the new value chain.

Indeed, the EU's policies have encouraged the development of decentralized electricity generation, electric vehicles, energy storage and flexible demand. This change has given DSOs the opportunity to rethink traditional system operations and reflect on how to best develop and operate Europe's distribution networks with a view to the future.

So all of Europe, more or less, has now entered a transition phase in which energy systems are required to be simultaneously more efficient, more intelligent and more economical in CO<sub>2</sub>. Our energy landscape is being restructured at varying speed from one country to another, but it is based everywhere on the 'three times twenty' rule — driven by the European Union: 20% energy from renewable sources; 20% improved energy efficiency; and 20% fewer greenhouse gas emissions. Three major targets to be achieved by 2030. Networks will have an essential role to play in this: tougher targets for renewable energy requiring us to construct additional new electricity transmission lines and more generally to rethink the entire electrical system. As part of the 'Connecting Europe Facility' program, nearly 6 billion euros will be committed between now and 2020 to boosting Europe's electrical security and improving the Union's gas and electricity infrastructures. And distribution networks in Europe will require €400 billion of investment by 2020, representing two thirds of total network investment.

The second major change taking place on energy networks is the upsurge in the digital economy that is revolutionizing the situation, with the possibility of using energy networks to make increasingly accurate and detailed information to the greatest number of people, making the consumer a 'prosumer'! Of course, energy did not await the recourse to 'smart grids' to be intelligent. There has always been a desire to connect networks better and use technologies to serve them better. But nowadays the main innovation lies in increased digitization, with the new ability to handle extraordinary quantities of data. In the coming years, the electricity distributors will become real market facilitators, allowing for high quality retail market processes and providing market actors with neutral access to metering data. They are essentially privileged players to guarantee the quality, metering accuracy and performance of the electricity delivered.

Finally, intelligence will also be implemented in new forms of energy use. For example, a giant step will have been taken when industrial companies are able to store electricity. From another viewpoint, there has been considerable progress towards energy-positive buildings: in the medium term, homes and workplaces will have become so intelligent that they will become fully-fledged power-generating sites.

I cannot finish my remarks about infrastructures without emphasizing the extent to which infrastructures play an even more central role in other continents, where the poverty of electricity networks is inseparable from the shortage of production facilities. Can it be right that 1.2 billion people in the world today live without electricity? I'll tell you what I think; we, energy economists, cannot only argue about free market or carbon targets; we have to stare this unacceptable reality in the face, that there are millions of people who quite simply don't have access to any power network

and who live without electricity. How should we sustainably consider differences in development that result in the 750 million inhabitants of Sub-Saharan Africa consuming the equivalent of the lovely New York State, our hosts since Sunday? How do we accept that, every year, between one and two million deaths in Africa are directly linked to shortages of electricity that, for example, leave hospitals unable to counter random power outages for lack of generators and prevent premature babies being cared for in incubators? Unimaginable conditions for anyone living in a developed country.

In town, shortages of electricity deprive populations of water, because the pumps are usually electric. Without water and without electricity, the slightest attempt at development is doomed to failure. For example, in Tanzania, where only 14% of the population is supplied with electricity, the World Bank estimates that faults in the electrical sector reduce the growth rate of GDP by 1.4%. And in India, experts concluded that it would not achieve its growth targets due to an inadequate electricity system, and that a large part of some cities with more than 1 million inhabitants are without electricity and water supplies!

International aid is already playing its part, like the World Bank and its 500 million dollar program dedicated to electricity distribution networks in Ethiopia. The African Development Bank also has a significant commitment. But we have to go further and encourage, for example, the creation of interconnected electricity networks, particularly between the major African watersheds; thus a project emerges, with its focus in Ethiopia, leading electricity producer in the region, that would link Kenya, Tanzania, Uganda, Rwanda, Burundi, Djibouti and Sudan. So, there are no less than 9 countries that could be involved, in the medium term, in a large, pan-African interconnected electricity network.

In conclusion, I would like to pay tribute to the work accomplished in recent years by energy economists in the field of optimizing the energy mix, while also taking account of local imperatives of energy policy.

Energy economists have been able to undertake the enormous task of controlling energy demand and they must be successful. But my message here today is to call upon energy economists to focus work on the role of distribution networks.

I will even go as far as suggesting, why not, that we consider energy systems in another way: rather than starting from the supply side, why not try to include the specification for tomorrow's energy systems in the expression of the end consumers' needs? Rather than considering electricity networks as a simple adjustment variable between supply and demand, shouldn't they now be considered as key resources, still greatly under-estimated, in the success of the energy transition?

I would be pleased to meet with you to discuss this new, bottom-up approach, clearly brimming with lessons for us all.

Thank you for your attention.